IIT Hyderabad director calls for alternatives to ventilators

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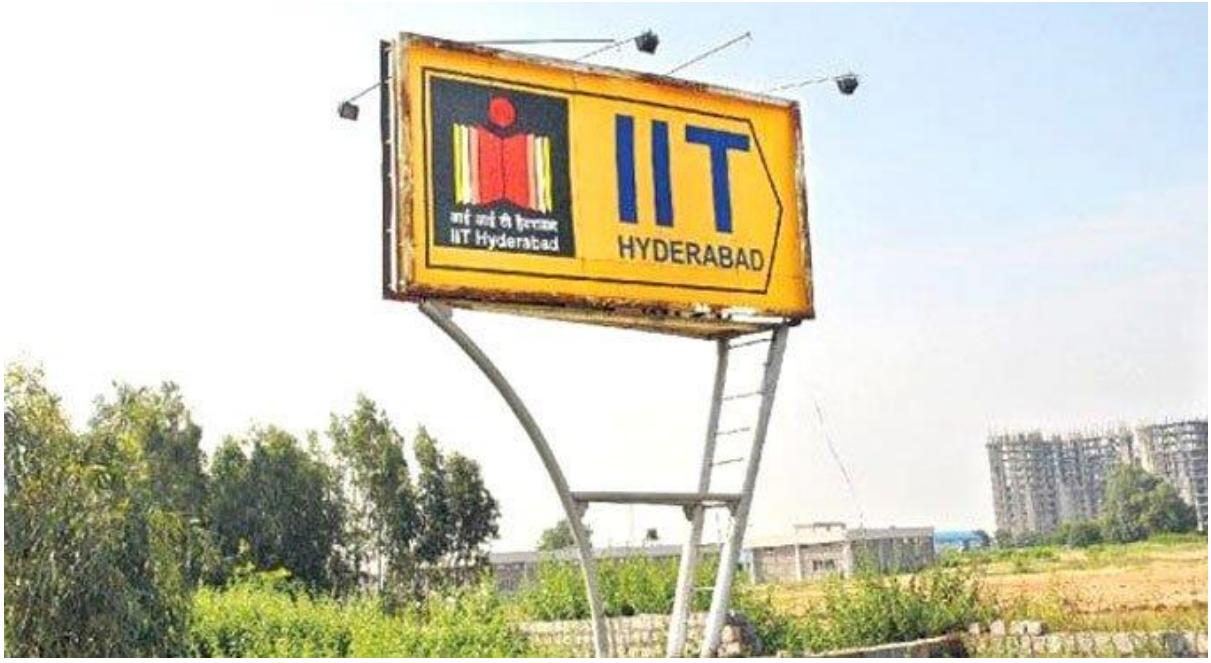

Hyderabad: Indian Institute of Technology Hyderabad director Prof BS Murty has asked the Central government to consider adopting 'bag valve masks' as an alternative to meet any surge in demand for ventilators to treat COVID-19 patients.

While the conventional ventilators are expensive, hard to produce, and not portable, Prof. Murty and Prof. V. Eswaran, Department of Mechanical and Aerospace Engineering, IIT-H, said 'bag valve masks' were small devices used to deliver breathing support in emergency situations that are inexpensive, easy to produce, and portable. The most common of these devices often called by the propriety name of 'Ambu Bag,' is used for resuscitation in emergency situations.

They said while 'bag valve masks' are currently hand-powered and therefore not suitable for continuous use as a ventilator, it would be easy to design a similar device powered by an electrical source, which could be a car battery, apart from the conventional power supply. It could be made portable, and therefore adopted in villages and other areas without a power supply and be inexpensive enough to manufacture in bulk.

Elaborating on the advantages of this system, Prof. Murty said: "Our estimate of the cost is that it can be manufactured for less than Rs 5000, or one-hundredth the cost of a conventional machine. The cost of manufacturing 6 million of these devices will be probably less than that of the inadequate number of 60,000 conventional machines mentioned above. The cost is so

low that it can be considered a single-use device that will be given over to single patient, and never used again."

They also said the idea was not new. In the past few weeks, many countries have come up with this idea of manufacture of low-cost ventilators and have even started competitions where the winning design would be declared open-source, which are not patented, and can be given free for anyone to adopt. Several designs are already available for 3-D printing, and so can be manufactured on a small scale on a 3-D printer.

The IIT professors said that assuming a low six per cent infection rate, in case COVID-19 advancement in India continues, in the Indian population of 1.3 billion, that would mean that around 80 million people would get affected. Of these 80 million, at least 5 per cent (4 million patients) would require ventilators. Each of these 4 million patients would need the ventilators for around 21 days, thereby blocking that machine for at least that amount of time.

Further, the machines are not portable and are found only in high-end hospitals in large cities, so patients from villages would need to be transported to these cities, which would be a logistics problem of unimaginable complexity. It is quite clear that even a mild 6 per cent Stage-3 would overwhelm the country's capacity to a devastating degree. Even if the Indian Industry was at peak production, it could manufacture only another 60,000 machines in the next 10 months, at a cost of Rs. 3,600 crore, they said.

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